



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,099	01/16/2004	Paul Marcius Butterfield	117435	4975
27074 7590 02/15/2008 OLIFF & BERRIDGE, PLC. P.O. BOX 320850 ALEXANDRIA, VA 22320-4850			EXAMINER ZHU, RICHARD Z	
			ART UNIT 2625	PAPER NUMBER
			NOTIFICATION DATE 02/15/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction27074@oliff.com  
jarmstrong@oliff.com

## Office Action Summary

Application No.

10/758,099

Applicant(s)

BUTTERFIELD ET AL.

Examiner

Richard Z. Zhu

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) ✓
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/04/2008 has been entered.

### ***Response to Applicant's Arguments***

2. Applicant's arguments had been duly considered and they are persuasive. Previous grounds of rejections are withdrawn. New grounds of rejection are entered in view of applicant's amendment to the claims.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 1-5, 7-9, 14-17, and 19-20 are rejected under 35 USC 103 (a) as being unpatentable over *Castelli et al. (US 5748221 A)* in view of *Nakamura et al (US 5333010 A)*.

Regarding Claim 1, *Castelli* discloses a method for detecting color misregistration (Col 3, Rows 24-27) in an image forming system (Col 3, Row 30) comprising:

forming a registration patch with the image forming system (Col 6, Rows 65-67).

calculating or selecting a combined color value for the registration patch (Col 6, Row 67 – Col 7, Row 2, colors are selected to adequately represent the printer's collection of colors);

performing spectrophotometric analysis on the registration patch to detect a detected color value (Col 3, Rows 34-40 and Col 6, Rows 61-63).

determining if color misregistration has occurred based on the spectrophotometric analysis of the registration patch (Col 7, Rows 2-10, the results of the mapping are verified and evaluated).

*Castelli* does not disclose determining if color misregistration has occurred by comparing the detected color value with the combined color value.

*Nakamura* discloses a color misregistration detection means that:

calculating or selecting a combined color value for a received image signal (Col 5, Rows 3-12, a luminance signal is generated from the received and/or detected R, G, B primary colors. As it is known for RGB space that uses ITU-R BT. 709, luminance or  $Y = .2126R + .7152G + .0722B$ , a combined color value for the received and/or detected R, G, B primary color signals);

performing spectrophotometric analysis on the received image signal to detect a detected color value (Col 5, Rows 13-40);

determining if color misregistration has occurred by comparing the detected color value with the combined color value (Fig 4, Col 5, Rows 3-40 and see Col 6, Rows 37-47, color misregistration is detected on the basis of R-Y and B-Y whereas R and B are the detected color values and Y is the combined color value. The comparison is done by generating the difference between R and Y as well as B and Y).

It would've been obvious to one of ordinary skill in the art at the time of the invention to use the spectrophotometric analysis technique of *Nakamura* as the time-series analysis technique of *Castelli* whereas the motivation would've been to provide a color misregistration easing system capable of easing color misregistration without causing visual unnaturalness (*Nakamura*, Col 2, Row 67 – Col 3, Row 2).

Regarding Claim 2, *Castelli* discloses the step of forming a registration patch (Col 6, Rows 65-67) further comprising steps of:

forming the registration patch in a combination of colors having a composite color value equivalent to the calculated or selected value (Col 6, Row 65 – Col 7, Row 2, the color patches are printed using colors that adequately represent the printer's collection of colors).

Regarding Claim 3, *Castelli* discloses the method for detecting color misregistration further comprising generating an output signal in response to determining if color misregistration has occurred (Col 3, Rows 38-40, a third detector that generates a signal indicative of a registration value between a plurality of color separations and see Col 7, Rows 2-9, a calibration is performed once misregistration is determined to have occurred).

Regarding Claim 4, *Castelli* discloses that the output signal indicates whether the image forming system is performing within satisfactory limits (Col 6, Rows 22-27, the results as indicated by the output signal is used to calibrate the printer of interest with the mapping to absolute or desired color coordinates).

Regarding Claims 5, *Castelli* discloses the method for detecting color misregistration, performing spectrophotometric analysis and the spectrophotometric analysis further comprising:

scanning the registration patch with a spectrophotometric device (Col6, Rows 17-30, and Row 61 – Col 7, Row 4);

and obtaining a degree of color misregistration based on known dimensions of the registration patch and an amount of color shift between the color detected by the spectrophotometric device (Col 6, Rows 39-55. In order for this invention to be enabled, i.e. to measure the relative positions of different color components, the system needs to be aware of the dimension of the patch so that it may know the range to properly direct the scanning, as demonstrated in Col 8, Rows 31-40) and the calculated or selected color value (Col 7, Rows 2-10, the results of the mapping between extracted image color data and selected color data are verified and evaluated).

*Castelli* does not disclose such process is on the basis of the combined color value.

*Nakamura* discloses obtaining a degree of color misregistration based on an amount of color shift between a detected color value and the combined color value (Fig 4, Col 5, Rows 3-40 and see Col 6, Rows 37-47, color misregistration is detected on the basis of R-Y and B-Y whereas R and B are the detected color values and Y is the combined color

value. The comparison is done by generating the difference between R and Y as well as B and Y, which in turn determines the magnitude of correction signal and the average color update signal to correct the misregistration).

Regarding Claim 7, *Castelli* discloses the method for detecting color misregistration further comprising performing an adjustment operation if it is determined that an unacceptable level of color misregistration has occurred (Col 6, Rows 22-27, calibration of output is performed to assure color constancy).

Regarding Claim 8, *Castelli* discloses an image forming system capable of detecting and adjusting for color misregistration comprising:

a plurality of image forming stations, each image forming station forming an image in one color (Fig 6, Development Stations C and D);

a charge retentive surface which receives each image from its corresponding image forming station and transfers the combined image to a recording medium (Fig. 6, belt 10, and see Col 4, Rows 25-30);

a spectrophotometric device either attached to or integral to the image forming system (Col 6, Rows 61-64, spectrophotometer connected via neural networks and Col 6, Rows 9-16, the main sensor of the invention is integral to the image forming system); and

a controller that causes the spectrophotometric device to perform detection of color misregistration on at least one registration patch (Fig. 7, Controller).

*Castelli* does not disclose determining if color misregistration has occurred by comparing a detected color value of the registration patch that is detected by the spectrophotometric device to a combined value of the registration patch that is calculated or selected.

*Nakamura* discloses detection of color misregistration has occurred by comparing a detected color value of the registration patch that is detected by the spectrophotometric device to a combined value of the registration patch that is calculated or selected (**Fig 4, Col 5, Rows 3-40 and see Col 6, Rows 37-47, color misregistration is detected on the basis of R-Y and B-Y whereas R and B are the detected color values and Y is the combined color value. The comparison is done by generating the difference between R and Y as well as B and Y).**

It would've been obvious to one of ordinary skill in the art at the time of the invention to use the spectrophotometric analysis technique of *Nakamura* as the time-series analysis technique of *Castelli* whereas the motivation would've been to provide a color misregistration easing system capable of easing color misregistration without causing visual unnaturalness (*Nakamura*, Col 2, Row 67 – Col 3, Row 2).

**Regarding Claim 9, *Castelli* discloses the controller further implements an adjustment to reduce detected misregistration (Col 6, Rows 22-27).**

**Regarding Claim 14, *Castelli* discloses the registration patch is formed in a combination of colors having a composite color value equivalent to the combined color value (Col 6, Row 67 – Col 7, Row 2, colors are selected to adequately represent the printer's collection of colors and see Column 6, Rows 30-55 where composite colors cyan and**



**magenta are anticipated to be part of the groups of colors that needed to be analyzed. Therefore, if there exist devices to analyze composite colors, then that means patches are formed from these colors).**

**Regarding Claims 15 and 16, *Castelli* discloses the controller further implements an output signal which indicates the results of the detection of the color misregistration (Fig 7, Controller, and see Col 3, Rows 34-40 first/second/third detectors being controlled to perform spectrophotometric analysis and see Col 7, Rows 1 –31, a factory calibration process is performed to correct any error whereas such process is impossible without a signal indicating the necessity of said process) and output signal indicates whether the image forming system is performing within satisfactory limits (Col 6, Rows 22-27, the results as indicated by the output signal is used to calibrate the printer of interest with the mapping to absolute or desired color coordinates).**

**Regarding Claim 17, *Castelli* discloses the method for detecting color misregistration, performing spectrophotometric analysis and the spectrophotometric analysis further comprising:**

**scanning the registration patch with a spectrophotometric device (Col6, Rows 17-30, and Row 61 – Col 7, Row 4);**

**and obtaining a degree of color misregistration based on known dimensions of the registration patch and an amount of color shift between the color detected by the spectrophotometric device (Col 6, Rows 39-55. In order for this invention to be enabled, i.e. to measure the relative positions of different color components, the system needs to be aware of the dimension of the patch so that it may know the range to properly direct**

the scanning, as demonstrated in Col 8, Rows 31-40) and the calculated or selected color value (Col 7, Rows 2-10, the results of the mapping between extracted image color data and selected color data are verified and evaluated).

*Castelli* does not disclose such process is on the basis of the combined color value.

*Nakamura* discloses obtaining a degree of color misregistration based on an amount of color shift between a detected color value and the combined color value (Fig 4, Col 5, Rows 3-40 and see Col 6, Rows 37-47, color misregistration is detected on the basis of R-Y and B-Y whereas R and B are the detected color values and Y is the combined color value. The comparison is done by generating the difference between R and Y as well as B and Y, which in turn determines the magnitude of correction signal and the average color update signal to correct the misregistration).

Regarding Claim 19, *Castelli* discloses at least one adjustment operation (Col 6, Rows 17-30, calibration operation) wherein the adjustment operation is able to alter an image forming process of at least one of the plurality of image forming stations (Fig 6, Development Stations C and D) if a spectrophotometric analysis indicates color misregistration has occurred (Col 6, Rows 17-30, instruments are calibrated in response to any color inconsistency to ensure constant color).

Regarding Claim 20, *Castelli* discloses an apparatus comprising:

means for forming images (Col 4, Rows 5-7, an imaging system);

means for creating at least one registration patch (Col 6, Rows 65-67, a number of patches) having a combined color value (Col 6, Row 67 – Col 7, Row 2, colors are selected

to adequately represent the printer's collection of colors, a combination of RGB or CMYK);

means for performing spectrophotometric analysis on the at least one registration patch to detect a detected color value (Col 3, Rows 34-40 and Col 6, Rows 61-63);

means for determining if color misregistration has occurred based on the spectrophotometric analysis of the registration patch (Col 6, Rows 10-30);

means for adjusting the image forming process to adjust for the color misregistration (Col 6, Rows 22-27).

*Castelli* does not disclose means for determining if color misregistration has occurred on images formed by the means for forming images by comparing the detected color value to the combined color value.

*Nakamura* discloses a color misregistration detection means (Fig 1, Color Misregistration Detecting Means 38) that:

calculating or selecting a combined color value for a received image signal (Col 5, Rows 3-12, a luminance signal is generated from the received and/or detected R, G, B primary colors. As it is known for RGB space that uses ITU-R BT. 709, luminance or  $Y = .2126R + .7152G + .0722B$ , a combined color value for the received and/or detected R, G, B primary color signals);

performing spectrophotometric analysis on the received image signal to detect a detected color value (Col 5, Rows 13-40);

determining if color misregistration has occurred by comparing the detected color value with the combined color value (Fig 4, Col 5, Rows 3-40 and see Col 6, Rows 37-47, color misregistration is detected on the basis of R-Y and B-Y whereas R and B are the detected color values and Y is the combined color value. The comparison is done by generating the difference between R and Y as well as B and Y).

It would've been obvious to one of ordinary skill in the art at the time of the invention to use the spectrophotometric analysis technique of *Nakamura* as the time-series analysis technique of *Castelli* whereas the motivation would've been to provide a color misregistration easing system capable of easing color misregistration without causing visual unnaturalness (*Nakamura*, Col 2, Row 67 – Col 3, Row 2).

5. Claims 10-13 are rejected under 35 USC 103 (a) as being unpatentable over *Castelli et al.* (US 5748221 A) and *Nakamura et al* (US 5333010 A) in view of what is well known.

Regarding Claims 10-13, *Castelli* discloses each elements of Claim 9 from which Claims 10-13 are dependent upon.

Furthermore, *Castelli* discloses that the image forming system is an imaging system that is used to produce color outputs (Fig. 6, **printing machine and Col 4, Rows 5-10**).

However, *Castelli* does not explicitly disclose that the printing machine is a digital photocopier, an ink jet printer, or a laser printer. Nonetheless, the cited printing machines are well known species of genus printing machines.

Therefore, it is well within the knowledge of one ordinarily skilled in the art to use the above-mentioned copiers and printers as the image forming system because each of said copiers and printers are qualified to perform superbly in the endeavor of color printing and they are all very well known under the sun (**Official Notice**).

It would've been obvious to one ordinarily skilled in the art at the time of invention to use either a digital photocopier, an ink jet printer, a laser printer, a facsimile machine, or a combination facsimile machine and printer machine as the printing machine of *Castelli* in order to enable the printing of multi-color images from which spectrophotometric analysis can be performed.

6. Claims 6 and 18 are rejected under 35 USC 103(a) as being unpatentable over the combined teaching of *Castelli et al. (US 5748221 A)* and *Nakamura et al (US 5333010 A)* in view of *Uchida et al. (US 4816844 A)*.

While *Castelli* and *Nakamura* discloses the method and apparatus of Claim 1 and Claim 9 respectively, and the step of forming a registration patch comprises forming a registration patch which has at least two superimposed colors (*Castelli*, Col 6, Rows 30-55),

*Castelli* does not disclose that the colors form a line in perpendicular to a direction of color misregistration.

*Uchida* discloses a registration patch with a line (Fig. 5A-C, and see Col 3, Rows 35-55, magenta and cyan) perpendicular to a direction of color misregistration.

It would've been obvious to one ordinarily skilled in the art at the time of invention to form two superimposed colors in a line that is perpendicular to the direction of misregistration in order to discover any deviation that is attribute to a difference or differences in the time periods required for the transfer material to move between adjacent image forming stations (*Uchida*, Col 3, Rows 47-50) so that the fourth detector of *Castelli* (*Castelli*, Col 3, Rows 40-42) can properly determine when to initiate spectrophotometric analysis.

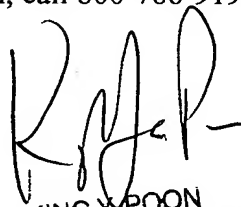
*Conclusion*

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 6731889 B2 and US 6856776 B2 discloses method and apparatus for measuring color misregistration on registration patches using a spectrophotometer. US 5164824 A discloses a method for detecting color misregistration similar to that of *Nakamura*.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Richard Z. Zhu whose telephone number is 571-270-1587 or examiner's supervisor King Y. Poon whose telephone number is 571-272-7440. Examiner Richard Zhu can normally be reached on Monday through Thursday, 6:30 - 5:00.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RZ<sup>2</sup>  
02/05/2008

  
KING Y. POON  
SUPERVISORY PATENT EXAMINER  
Richard Z. Zhu  
Assistant Examiner  
Art Unit 2625